17 15
23. The method of claim 21 wherein the upper section comprises the sleeve and the lower section comprises the ball and wherein the separating step comprises moving the sleeve upwardly around a downwardly extending elongate member for pushing the ball out of the sleeve as the sleeve moves upwardly.

B5

Remarks

The Official Office Action of March 11, 2002, and the references therein made of record have been carefully considered. There are attached copies of amended claims that include brackets to show deletions and underlining to show additions.

Claims 7, 8 and 10 have been cancelled. Claims 14 and 18 were rejected on the grounds that they depended from a rejected claim. Claims 11 and 16 have been amended to incorporate the limitations of claims 14 and 16 respectively. Dependent claims 14 and 18 have been cancelled. Claims 11 and 16 have been amended to add the phrases to the effect that the upper section is captured at a location adjacent the well head and the upper section is subsequently released. Claims 11-13, 15-17 and 19 should be allowable.

Newly submitted independent claim 21 is similar to claims 11 and 16 and should be allowable for the same reasons that claims 11 and 16 are allowable. Dependent claims 22-23 should also be allowable.

This leaves amended independent claim 1 for consideration. Claim 1 was rejected on Casey U.S. Patent 6,148,923. There are a number of differences between Casey's approach and applicant's. Relative to claim 1, there are two major differences between Casey and this invention, both of which are set forth in the following quotation:

> the sections comprising a ball and a sleeve providing a smooth rigid seating surface for receiving the ball so the ball and sleeve join together in the well for pushing liquid, above the piston, upwardly, the ball being freely movable into and out of the sleeve, the ball and sleeve being free of an assembly to resist movement of the ball out of the sleeve.

Casey's ball 80 seats against a resilient O-ring 64. Applicant has run enough of these plungers into wells to know that this is not acceptable for the following reasons.

Because the ball and sleeve come together in the bottom of a well at a location which is unseen, and unseeable, no one knows exactly what happens except from an examination of the ball and sleeve long afterward. It is very clear in the operation of applicant's device that many of the connections between the ball and sleeve are violent collisions. This is evident from the damage done to them. There is attached a Declaration of the inventor showing two sleeves that have been removed from wells. As is apparent from the photographs attached to the Declaration, the sleeves have been broken. Also as stated in the attached Declara-

B

tion, once in a great while the ball becomes substantially out of round after long use. The only way this can occur is from repeated collisions between the ball and sleeve or between the ball and the bumper spring. It is accordingly submitted that providing a smooth rigid seating surface for the ball is much preferred than trying to connect the ball and sleeve in a well many thousands of feet below the surface where the ball is supposed to seat against a resilient O-ring, as in Casey. There is, of course, no suggestion in Casey to provide a smooth rigid seating surface for the ball. It is accordingly submitted that claim 1 and its dependent claims are allowable over Casey.

Claim 1 also recites that the ball and sleeve are free of an assembly to resist movement of the ball out of the sleeve. Casey includes a second O-ring 67 that presumably has the function of holding the ball in its nested position in the sleeve or at least tending to retain the ball in its nested position. This allows Casey's ball and sleeve to separate only when they arrive at the surface and are presumably acted upon by larger pressure differentials than occur in the well.

Applicant's device does not work in this manner which allows applicant to eliminate an element of the prior art and still work quite satisfactorily. By eliminating such elements as the O-ring 67 of Casey, applicant's device is a simple, rugged device suited

B

for operation in wells for extended periods of time and requires little maintenance or attention. The Examiner will appreciate that eliminating an element and having no adverse effects is a very high order of inventiveness.

It is submitted that claim 1 and its dependent claims are allowable over Casey or any combination suggested by the Examiner.

It is accordingly submitted that this application is in condition for allowance and early steps toward that end are earnestly solicited.

Respectfully submitted,

G. Turner Moller
Registration 22,978

711 N. Carancahua, Suite 720
720 American Bank Plaza
Corpus Christi, Texas
361/883-7257
May 15, 2002

B

1. (Amended) A plunger lift for a well producing through a production string communicating with a hydrocarbon formation, comprising a free piston having at least two sections, movable independently downwardly in the well, the sections comprising a ball and a sleeve providing a smooth rigid seating surface for receiving the ball so the ball and sleeve join together in the well for pushing liquid, above the piston, upwardly, the ball being freely movable into and out of the sleeve, the ball and sleeve being free of an assembly to resist movement of the ball out of the sleeve.

4. (Amended) The plunger lift of claim 1 wherein the sleeve comprises an upper section having an upper end and an open lower end providing the smooth rigid seating surface, the seating surface comprising an annular hemispherical seating surface sized to receive the ball.

B

11. (Twice Amended) A method of lifting liquids from a well producing hydrocarbons from a formation with a plunger lift having a multipart piston made of a material having a density less than about .25 pounds/cubic inch selected from the group consisting essentially of silicon nitride and titanium alloys having a tensile strength of at least 90,000 psi, comprising

placing a bumper assembly in the well adjacent the formation;

moving the upper and lower sections together upwardly into the well head and capturing the upper section at a location adjacent the well head;

dropping the lower section in the well, pausing for a time period and then, [;] after the lower section is travelling downwardly in the well, [dropping] releasing the upper section [in the well] and allowing it to drop into the well;

uniting the upper and lower sections into a unit near the formation and moving the unit upwardly in the well in response to formation gases passing into the well and thereby pushing liquid upwardly with the piston.

B

16. (Amended) A method of lifting liquids from a well producing hydrocarbons from a formation <u>through a well head</u> with a plunger lift having a multipart piston having at least one upper section and one lower section, movable independently downwardly in the well, the sections comprising a ball and a sleeve providing a seating surface for receiving the ball so the ball and sleeve join together in the well for pushing liquid, above the piston, upwardly, comprising

<u>moving the upper and lower sections together upwardly and capturing the upper section at a location adjacent the well head;</u>

dropping the lower section in the well<u>, pausing for a time period and then,</u> [;] after the lower section is travelling downwardly in the well, [dropping] <u>releasing</u> the upper section [in the well] <u>and allowing it to drop into the well</u>;

uniting the upper and lower sections into a unit near the formation and moving the unit upwardly in the well in response to formation gases passing into the well and thereby pushing liquid upwardly with the piston.

B